L Number	Hits	Search Text	DB	Time stamp
1	431	selective\$3 with (polysilicon or poly\$1 or (polycrystalline adj silicon))	USPAT;	2003/07/13 12:45
		with (CVD or PECVD or LPCVD or APCVD or (chemical adj vapor adj	US-PGPUB;	
		deposit\$5)) with (silicon or silane\$1 or disilane\$1 or chlorosilane\$1 or chloro-silane\$1 or (chloro adj silane\$1) or SiH4 or "SiH4" or "SiH.sub.4"	EPO; JPO; DERWENT;	
		or "Si H.sub.4" or Si2H6 or "Si2H6" or "Si.sub.2H.sub.6" or "Si.sub.2	IBM TDB	
		H.sub.6" or SiCl2H2 or "SiCl2H2" or "SiCl.sub.2H.sub.2" or "Si	_	
		Cl.sub.2 H.sub.2" or "SiCl.sub.2 H.sub.2" or "Si Cl.sub.2H.sub.2")		
2	465444	(upper or second or top or another) adj3 (plate\$1 or electrode\$1)	USPAT;	2003/07/13 11:40
			US-PGPUB; EPO; JPO;	
			DERWENT;	
			IBM_TDB	
3	11	(selective\$3 with (polysilicon or poly\$1 or (polycrystalline adj silicon))	USPAT;	2003/07/13 11:40
		with (CVD or PECVD or LPCVD or APCVD or (chemical adj vapor adj	US-PGPUB;	
		deposit\$5)) with (silicon or silane\$1 or disilane\$1 or chlorosilane\$1 or chloro-silane\$1 or (chloro adj silane\$1) or SiH4 or "SiH4" or "SiH.sub.4"	EPO; JPO; DERWENT;	
		or "Si H.sub.4" or Si2H6 or "Si2H6" or "Si.sub.2H.sub.6" or "Si.sub.2	IBM TDB	
		H.sub.6" or SiCl2H2 or "SiCl2H2" or "SiCl.sub.2H.sub.2" or "Si	_	
		Cl.sub.2 H.sub.2" or "SiCl.sub.2 H.sub.2" or "Si Cl.sub.2H.sub.2"))		
	2	with ((upper or second or top or another) adj3 (plate\$1 or electrode\$1))	USPAT;	2003/07/13 12:02
4	3	(("4497683") or ("5006911") or ("4963506")).PN.	US-PGPUB	2003/07/13 12.02
5	25	(selective\$3 with (polysilicon or poly\$1 or (polycrystalline adj silicon))	USPAT;	2003/07/13 12:11
		with (CVD or PECVD or LPCVD or APCVD or (chemical adj vapor adj	US-PGPUB;	
		deposit\$5)) with (silicon or silane\$1 or disilane\$1 or chlorosilane\$1 or	EPO; JPO;	
		chloro-silane\$1 or (chloro adj silane\$1) or SiH4 or "SiH4" or "SiH.sub.4"	DERWENT;	
		or "Si H.sub.4" or Si2H6 or "Si2H6" or "Si.sub.2H.sub.6" or "Si.sub.2 H.sub.6" or SiCl2H2 or "SiCl2H2" or "SiCl.sub.2H.sub.2" or "Si	IBM_TDB	
		Cl.sub.2 H.sub.2" or "SiCl.sub.2 H.sub.2" or "Si Cl.sub.2H.sub.2"))		
		same ((upper or second or top or another) adj3 (plate\$1 or electrode\$1))		
6	581471	capacitor or capacitors or DRAM or DRAMs	USPAT;	2003/07/13 12:12
			US-PGPUB; EPO; JPO;	
			DERWENT;	
			IBM_TDB	
7	5953	BST or "BST" or (barium adj strontium adj titanate) or	USPAT;	2003/07/13 12:14
		(barium-strontium-titanate) or bariumstrontiumtitanate	US-PGPUB;	
			EPO; JPO; DERWENT;	
			IBM TDB	,
8	26351	(tantalum adj (oxide or dioxide or pentoxide or pent-oxide)) or Ta2O5 or	USPAT;	2003/07/13 12:19
		"Ta2O5" or "Ta.sub.2O.sub.5" or "Ta.sub.2 O.sub.5" or TaO2 or "TaO2"	US-PGPUB;	
		or "TaO.sub.2" or "Ta O.sub.2" or TaO or "TaO"	EPO; JPO; DERWENT:	
			IBM_TDB	
9	1480	(capacitor or capacitors or DRAM or DRAMs) and (BST or "BST" or	USPAT;	2003/07/13 12:43
		(barium adj strontium adj titanate) or (barium-strontium-titanate) or	US-PGPUB;	
		bariumstrontiumtitanate) and ((tantalum adj (oxide or dioxide or	EPO; JPO;	
		pentoxide or pent-oxide)) or Ta2O5 or "Ta2O5" or "Ta.sub.2O.sub.5" or "Ta.sub.2 O.sub.5" or TaO2 or "TaO2" or "TaO.sub.2" or "Ta O.sub.2" or "Ta O.sub.2" or	DERWENT; IBM_TDB	
		TaO or "TaO")	I DIVI_I DB	
10	1289	crystal\$7 with ((BST or "BST" or (barium adj strontium adj titanate) or	USPAT;	2003/07/13 12:44
		(barium-strontium-titanate) or bariumstrontiumtitanate) or ((tantalum adj	US-PGPUB;	
		(oxide or dioxide or pentoxide or pent-oxide)) or Ta2O5 or "Ta2O5" or "Ta.sub.2O.sub.5" or "Ta.sub.2 O.sub.5" or TaO2 or "TaO2" or	EPO; JPO; DERWENT;	
		"TaO.sub.2" or "Ta O.sub.2" or TaO or "TaO2" or "TaO2" or "TaO3"))	IBM TDB	
11	615	(capacitor or capacitors or DRAM or DRAMs) and (crystal\$7 with ((BST	USPAT;	2003/07/13 12:44
		or "BST" or (barium adj strontium adj titanate) or	US-PGPUB;	
		(barium-strontium-titanate) or bariumstrontiumtitanate) or ((tantalum adj	EPO; JPO;	
		(oxide or dioxide or pentoxide or pent-oxide)) or Ta2O5 or "Ta2O5" or "Ta.sub.2O.sub.5" or "Ta.sub.2 O.sub.5" or TaO2 or "TaO2" or	DERWENT; IBM TDB	
		"TaO.sub.2" or "Ta O.sub.2" or TaO or "TaO")))	ם מו בייום ו	

12	788	selective\$3 with (polysilicon or poly\$1 or (polycrystalline adj silicon))	USPAT:	2003/07/13 12:45
12	/00	with (CVD or PECVD or LPCVD or APCVD or (chemical adj vapor adj	US-PGPUB;	2003/07/13 12.43
		deposit\$5))	EPO: JPO:	
		(uchosima))	DERWENT;	
			IBM TDB	
12		((capacitor or capacitors or DRAM or DRAMs) and (crystal\$7 with	USPAT:	2003/07/13 12:47
13	9			2003/07/13 12.47
		((BST or "BST" or (barium adj strontium adj titanate) or (barium-strontium-titanate) or bariumstrontiumtitanate) or ((tantalum adj	US-PGPUB; EPO; JPO;	
		1 ' ' ' '	DERWENT:	•
		(oxide or dioxide or pentoxide or pent-oxide)) or Ta2O5 or "Ta2O5" or	IBM TDB	
		"Ta.sub.2O.sub.5" or "Ta.sub.2 O.sub.5" or TaO2 or "TaO2" or	IBM_IDB	
_		"TaO.sub.2" or "Ta O.sub.2" or TaO or "TaO")))) and (selective\$3 with		
		(polysilicon or poly\$1 or (polycrystalline adj silicon)) with (CVD or		
		PECVD or LPCVD or APCVD or (chemical adj vapor adj deposit\$5))		
		with (silicon or silane\$1 or disilane\$1 or chlorosilane\$1 or		
		chloro-silane\$1 or (chloro adj silane\$1) or SiH4 or "SiH4" or "SiH.sub.4"		
		or "Si H.sub.4" or Si2H6 or "Si2H6" or "Si.sub.2H.sub.6" or "Si.sub.2		
	1	H.sub.6" or SiCl2H2 or "SiCl2H2" or "SiCl.sub.2H.sub.2" or "Si		
		Cl.sub.2 H.sub.2" or "SiCl.sub.2 H.sub.2" or "Si Cl.sub.2H.sub.2"))	LICDATE	2002/07/12 12:00
-	3	(("6458699") or ("6509239") or ("6159852")).PN.	USPAT;	2003/07/13 12:00
	1	1	US-PGPUB	l

DOCUMENT-IDENTIFIER: US 20010019875 A1

TITLE: Electrode structure of capacitor

for semiconductor

memory device and fabrication method

thereof

----- KWIC -----

Claims Text - CLTX (32):

31. The method of claim 30, wherein the conductive layer is <u>selectively</u> formed on the <u>upper and lower electrode</u> composed of <u>polycrystalline silicon by</u> a CVD.

US-PAT-NO:

5312769

DOCUMENT-IDENTIFIER:

US 5312769 A

TITLE:

Method of making a semiconductor

memory device

----- KWIC -----

Brief Summary Text - BSTX (12):

According to the invention, a method of fabricating a semiconductor memory

device is provided, comprising the steps of: forming transistors on a

semiconductor substrate; forming polycrystalline silicon

lead pads on said

semiconductor substrate, each of said polycrystalline
silicon lead pads

electrically connected to said transistors; forming a first interlayer

insulating film over said transistors and said

polycrystalline silicon lead

pads; forming bit lines electrically connected to said transistors; forming a

second interlayer insulating film on said bit lines; forming contact holes in

said first interlayer insulating film, for exposing surfaces of said

polycrystalline silicon lead pads; selectively growing
first polycrystalline

silicon films on said surfaces of said first

polycrystalline silicon lead pads,

and laterally growing upper portions of said

polycrystalline silicon films, by

a **selective chemical vapor deposition** technique, thereby forming lower portions

of storage electrodes; forming oxide films on top and side surfaces of said

lower portions of said storage electrodes; anisotropically etching said oxide

films, for leaving portions of said oxide films on said side surfaces of said

storage electrodes; selectively growing second
polycrystalline silicon films on
said top surfaces of said first polycrystalline silicon
films by a selective
chemical vapor deposition technique, thereby forming upper
portions of said
storage electrodes; removing said portions of said oxide
films; forming
dielectric films on said storage electrodes; and forming
plate electrodes on
said dielectric films.

Claims Text - CLTX (11):

selectively growing second polycrystalline silicon films
on said top
surfaces of said first polycrystalline silicon films by a
selective chemical
vapor deposition technique, thereby forming upper portions
of said storage
electrodes;

US-PAT-NO: 5330936

DOCUMENT-IDENTIFIER: US 5330936 A

TITLE: Method of producing a silicon

nitride film and method of

fabricating a semiconductor device

----- KWIC -----

Abstract Text - ABTX (1):

A method of producing a silicon nitride film free of photolithographty and

dry etching processes and a method of fabricating a semiconductor memory cell

device are disclosed. A first **polycrystalline silicon** film serving as a bottom

electrode is **selectively** formed only on a **silicon** region of the substrate with

a field oxide film and a <u>silicon</u> nitride film is **selectively** formed only on the

first polycrystalline silicon film by selective chemical vapor deposition in

which a source gas including a combination of both ammonia and either **silane** or

dichlorosilane is doped with hydrogen chloride. Then, a second polycrystalline

film serving as a <u>top electrode</u> is selectively formed on the silicon nitride film.

Brief Summary Text - BSTX (3):

Stacked capacitors or trench capacitors which serve as memory cells of a $\ensuremath{\mathsf{a}}$

dynamic random access memory (DRAM) are well known. The conventional method of

fabricating the typical stacked capacitor will hereinafter be described in

detail with reference to the accompanying drawings.

Referring to FIG. 1, a

field oxide film 1 which serves to separate a memory cell

07/13/2003, EAST Version: 1.03.0002

from other elements of the semiconductor device has selectively been formed on a **silicon** substrate 2 by the local oxidation of **silicon** (LOCOS), as shown in FIG. 1, before a polycrystalline silicon film 3A is deposited on the entire region of the silicon substrate 2 including the field oxide film region by chemical vapor deposition (CVD) not shown in FIG. 1. Then, the polycrystalline silicon film 3A is subjected to patterning by means of photolithography and dry etching so as to form a bottom electrode only on the silicon region of the substrate as shown in FIG. 1(b). As shown in FIG. 1(c), a silicon nitride film 4B and a polycrystalline silicon film 5A are deposited in turn on the entire region of the substrate including the field oxide film region. And then, as shown in FIG. 1(d), the polycrystalline silicon film 5A and the silicon nitride film 4B are simultaneously subjected to patterning by use of photolithography and dry etching to form a top electrode and a dielectric film respectively. Further, required in the fabrication process of the stacked capacitor are processes of controlling a conductivity of the capacitor by ion-implantation and heat treatment. Also required in the processes of photolithography and dry etching are the processes of cleaning, applying a resist, baking, exposing, removing a resist and the like.

Detailed Description Text - DETX (11):

An embodiment of a novel method of fabricating a typical stacked capacitor serving as memory cells will hereinafter fully be described in detail with reference to the accompanying drawings. Referring to FIG. 2(a), a field oxide film is formed up to thickness of 200 nm on a silicon substrate 2 by means of

07/13/2003, EAST Version: 1.03.0002

the local oxidation of silicon (LOCOS) so as to provide electrical separation of the capacitor from another element. As shown in FIG. polycrystalline silicon film 3 is deposited up to 40 nm only on the silicon region of the substrate opposite to the field oxide film region by means of the selective growth of polycrystalline silicon so as to form a bottom electrode of the capacitor. As shown in FIG. 2(c), a silicon nitride film 4 is selectively deposited up to 10 nm only on the polycrystalline silicon film 3 by means of the set forth selective chemical vapor deposition of silicon nitride so as to form a dielectric film of the capacitor. As shown in FIG. 2(d), a polycrystalline silicon film 5 is deposited up to 200 nm on the silicon nitride film 4 by means of the selective growth of polycrystalline silicon so as to form a top electrode of the capacitor. The stacked capacitor is completely fabricated without photolithography and dry etching. In the process of depositing the silicon nitride film 4, the selective chemical vapor deposition is carried out on condition that silicon diluted with helium/ammonia/hydrogen chloride is 60/1200/5 (sccm), the growth pressure is 0.18 torr and a growth temperature is 800 degrees. In this case, the silane gas is diluted with helium up to 1:4 in the volume ratio of silane to helium and the volume of a pure silane gas is 12 sccm. The selective chemical vapor deposition of silicon nitride is available on condition that the volume ratio of pure silane to hydrogen chloride is in the range of the volume ratio from 1:0.25 to 1:0.6 at a growth temperature of 800 degrees and at pressure of 1 atm. When the volume ratio of pure silane to hydrogen chloride is greater than 1:0.6, the polycrystalline silicon film 3 may be etched. In contrast,

when the volume ratio of pure silane to hydrogen chloride is less than 1:0.25, the selective chemical vapor deposition is not available. Growth of silicon crystal may be carried out on the field silicon oxide film on condition that the volume ratio of silane to hydrogen chloride is in the range from 1:0.25 Preferably, the volume ratio of silane to hydrogen chloride is in the range from 1:0.3 to 1:0.6. But at a high temperature, for example 850 degrees, decomposition of silane is promoted to increase the partial pressure of silylene, so that the selective chemical vapor deposition of silicon nitride may be available on condition that the volume ratio of silane to hydrogen

chloride is less than 1:0.7.

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